

PUBLIC INTEREST STATEMENT

1. Introduction

By the instant request ("STA Request"), Freeport-McMoRan Corporation ("Freeport") requests that the Commission grant to Freeport Special Temporary Authority ("STA") to operate the facilities (the "Facilities") specified in the instant STA Request. STA is requested for a 6 month period, commencing November 15, 2008.

2. Nature of the Operation/Necessity of Research/Inadequacy of Existing Technology

A. Description of the Nature of the Research Project Being Conducted

Freeport, the world's largest publicly-traded copper company, is committed to the safety of all personnel within its mines. To promote this commitment, Freeport is developing an accurate, consistent and effective ranging technology for tracking mine personnel and moving equipment not only for collision avoidance, but also to help achieve compliance with the "Mine Improvement and New Emergency Response Act of 2006" ("MINER Act") (PL 109-236). Such technology is intended to assist in safe operations of enormous haul trucks in the vicinity of ground personnel, as well as providing collision detection assistance for all haul truck operations. The goal of such equipment development is to provide truck operators the ability to detect persons and vehicles within the vicinity of the entire truck and to so notify truck operators so collisions can be avoided.

In this experiment for which STA is requested, Freeport requests authority to operate such collision-avoidance technology at its remotely-located open pit mines in Hurley, New Mexico, Leadville, Colorado and Green Valley, Arizona for a six month period during which the feasibility of such equipment for this use can be analyzed.

The experiment will involve the integration of existing Ultra-Wideband (UWB) technology for communication, ranging and location with mesh networking technology, and the utilization of Freeport's expertise with respect to mesh networking in mines, including but not limited to obstacle and collision detection and avoidance. The current UWB device is a commercially available low-cost wireless modem providing Universal Serial Bus (USB), high definition (HD) video and data pump connectivity in both the commercial and defense space. The proposed experiment will involve utilization of the UWB device's RF pulses to perform ranging with time of flight algorithm(s).

In the experiment, Freeport intends to adapt and implement the UWB technology for use in open pit mining scenarios, including asset tracking, obstacle/collision detection/avoidance and data transmission. This is intended to permit a sub-second update rate, providing accurate location reports instantaneously.

B. Necessity of Communications Facilities for the Research

Presently, there is no technology that commercially exists that will determine/provide close tolerance solution for direction/positioning of mining equipment and personnel that are actively moving at speeds up to 35 mph. The ability to address this time and space requirement is intended to prevent catastrophic accidents between large mining trucks and support vehicles by providing early warning of approaching machine or potential collisions between machines. The technology for which STA is requested will enable the development of positioning technology that will enable surface personnel to work safely around these machines also. The individual tracking product will also be utilized in underground mines, in furtherance of the requirements set forth in the MINER Act.

C. Inadequacy of Existing Communications Facilities

With respect to the operation of huge haul trucks at open pit mines, large blind spots inhibit the operator's ability to safely operate. Although Freeport is in the process of incorporating a project (WAVS) that has placed cameras on the haul truck which allows the operators to see the blind spots in the front, rear, and right side of the truck, such system does not permit the operator to see all three locations at once. Using the experimental positioning system (for which STA is requested in this application) in conjunction with the WAV system would allow full coverage around the truck ensuring the safety of ground personnel. There is no one system to guarantee the complete safety of personnel. Having said that, the use of multiple systems decreases the chance of injuries and/or fatalities within the mine significantly. This technology will also provide added safety for mines that have additional operational difficulties due to decreased visibility caused by fog or dusty environments.

While commercially available technologies provide geo-location capabilities, they are not without their disadvantages. Global Positioning System (GPS) over an FM communications network and RFID are two popular systems. Unfortunately, neither system is sufficiently accurate or timely in providing location coordinates and updates. Global Positioning System ("GPS") technologies are updated every 3 seconds with poor accuracies/multiple meter level.¹ RFID technologies also provide multiple meter level accuracy with extensive infrastructure.²

¹ The GPS system using the C/A signal has a location accuracy of 3-15 m; with a military only P(Y) signal the accuracy can be improved to about 30 cm, neither of which is sufficient. GPS system using real time kinematic (RTK) technique can improve the location accuracy to centimeters; but the update rate of GPS with RTK over the FM link is too slow -- once every three seconds. An example best illustrates the problem. For a haul truck moving at a speed of 35 mph, the truck travels 150 ft in between location updates (at once every three seconds), which is too slow to prevent a collision with either a person or another vehicle. In addition, the location accuracy of GPS heavily relies on clear view of multiple satellites. In inclement weather or with a partial obstruction due to terrain, while the number of visible satellite signals can be reduced to two, this causes much higher triangulation error.

² RFID can provide only 3-5 m accuracy for location. Not only does RFID fail the centimeter requirement, it also requires fixed infrastructure. The ever changing mining environment will

Present communications technologies utilized in the mines provide only voice and production data information only, and will not provide the radio location functionality that will allow real time peer to peer location, and probability of an impending accident. The technology to be utilized in this experiment, however, has these functionalities, and this information – when presented to the operators and surface miners - will provide a warning system that will, it is hoped, save lives.

Given the dynamic mining environment and vehicle speeds, it is preferred that location accuracy be in the centimeter range. The ultra-short pulses of UWB technology allow for highly improved accuracy in locating assets, such as vehicles and personnel, and enable location accuracy within centimeters in contrast to the existing GPS and RFID technologies. Further, UWB technology does not require being able to see multiple GPS satellites at all times; nor does it need fixed infrastructure to provide excellent ranging precision. It provides robustness against passive interference from rain, mist, aerosols and metallic objects, and active interference from narrow band sources. The UWB transceiver, using a multiband approach, gives added robustness against multipath-induced fading. Due to the nature of the UWB waveform, the low power consumption allows extended battery lifetime of the tracker, ensuring uninterrupted monitoring and tracking of the assets.

3. Directional Antenna Data.

The Antenna Registration specifies “Yes” in response to the questions: “Is a directional antenna used?” Although in a majority of cases an omni antenna (with 3 dB gain) is intended to be employed, in certain situations a directional antenna (with 6 dB gain) will be employed. With respect to the directional antennas to be used in this experiment, the following information is provided.

Width of Beam at Half-Power Point	Orientation in Horizontal Plane	Orientation in Vertical Plane
90°	0-90° Azimuthal	-45-45° Elevation

4. Note Regarding Mean Power Designation

Due to the low duty cycle of the data transmission, only 100 symbols are transmitted in 1 ms (in the worse case scenario). A total averaged output power of 20 mW is radiated over 1.5 GHz of bandwidth. The 80mW mean ERP figure relates to the intended usage of the directional antenna (with 6 dB gain). When an omni antenna (with 3 dB gain) is employed, the anticipated mean ERP figure is 40 mW.

require installation of additional RFID infrastructure on a regular basis, making the technology cost-prohibitive.

5. Blanking Capabilities

Freeport understands that FAA or other stakeholders may require certain frequency blanking to ensure that the facilities do not pose a threat of interference to adjacent emitters. This is to confirm that the subject system has such blanking capabilities and that Freeport stands ready to work with the Commission to identify and implement any reasonable restrictions that may be required.

6. Stop Buzzer

Freeport hereby advises that Ken Pavloski will be available by wireless telephone at (928) 965-0062 and will act as a “stop buzzer” if any issues regarding interference arise during testing.

For the foregoing reasons, approval of this STA Request is in the public interest, convenience and necessity.